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Investment Boom and Capital Goods Industry

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The recent economic reforms have affected the manufacturing sector on four counts. First, with the abolition of industrial licensing, private sectors were able to build and expand their capacity without any regulation. Production of consumer durable goods started to meet the pent-up demand, which was not available under import-substitution policies.[1] Second, import quantitative regulation was relaxed and Indian manufacturers could therefore import capital and intermediate goods easily. Third, growth rate of public investment has decelerated. Fourth, private sector now had the option to procure money from financial market in addition to bank lending. During the 1980s, public investment played an important role to generate economic growth. And with the start of economic reforms in 1991, the share of the private corporate sector in total investment increased. This chapter examines the kind of impact economic reforms had on the capital goods industry.

1. INVESTMENT BOOM AFTER ECONOMIC REFORMS

During the first half of the 1980s, the central government allotted relative high percentage of the budget to public investment. Shares of capital outlay in total expenditure of the central government were around 15 per cent. However, accumulated budget deficits made the central government issue a large number of government bonds which became a burden afterwards. After 1987-8 interest payment exceeded capital outlay. The share of capital outlay went down to below 8 per cent after 1995-6. The private corporate sector increased investment rapidly and as a result, trends of gross fixed capital formation (GFCF) have not changed.

We can use data from National Accounts Statistics (NAS) and Annual Survey of Industries (ASI) to analyse GFCF. NAS shows that GFCF at the 1980-1 prices by the private corporate sector has grown rapidly since 1991-2. Although GFCF at the 1980-1 prices by the public sector has stagnated, total GFCF has increased constantly due to growth of the private corporate sector. ASI also expresses the same trends. But after 1995-6 they altogether show a different picture. In ASI, GFCF in the 1981-2 prices were stagnant in 1996-7 and 1997-8. The difference might be ascribed to three reasons. First, the coverage of data is different. While NAS covers the joint stock companies

registered under the Companies Act, ASI covers factories registered under the Factory Act, employing 10 or more workers and using power and employing 20 or more workers but not using power. ASI includes public sector companies. Second, while ASI depends upon unit-wise data, NAS uses company-wise data. Third, NAS has a problematic methodology. It depends upon the company finance studies released by Reserve Bank of India, which is not based on any scientific sampling scheme.[2] Therefore we will take the result of ASI.

Since ASI does not have used-based classification, we must aggregate three digit level data to produce used-based data series. National industrial classification (NIC) was changed from 1970 code to 1987 code. After it was changed, ASI changed the classification in 1989-90 to follow the new classification. This study produces used-based data series on the basis of 1987 code. Gross value added (GVA) is deflated by chain index of industry group. Annual inflation rate of specific year, denoted by P_t, is obtained using the formula:

$$P_t = \sum \frac{WPI_{i,t} V_i}{WPI_{i,t-1} V_a}$$

where V_i is net value added (NVA) of good i and V_a is total NVA of the industry group. Wholesale price index of good i is compared with previous year's and is weighted by the share of NVA in total NVA of the industry group. Index takes 1981-2 as the base year. GFCF is deflated by chain index of capital goods. GFCF at the 1981-2 prices accelerated after 1991-2 in all four industry groups (Figure 1). Annual average of GFCF of total industries at 1981-2 prices rose from Rs 7,191 crore between 1986-7 and 1990-1 to Rs 14,438 crore between 1991-2 and 1995-6. As mentioned later, the investment boom was accompanied

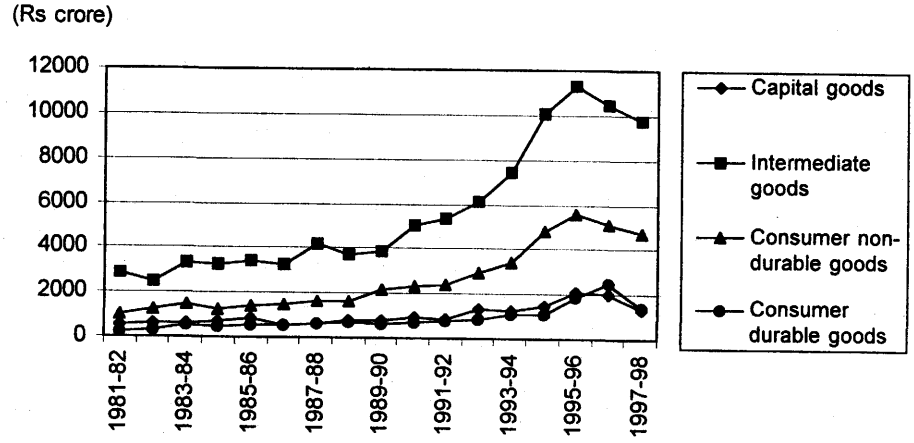

FIGURE 1. GFCF IN 1981-2 PRICES

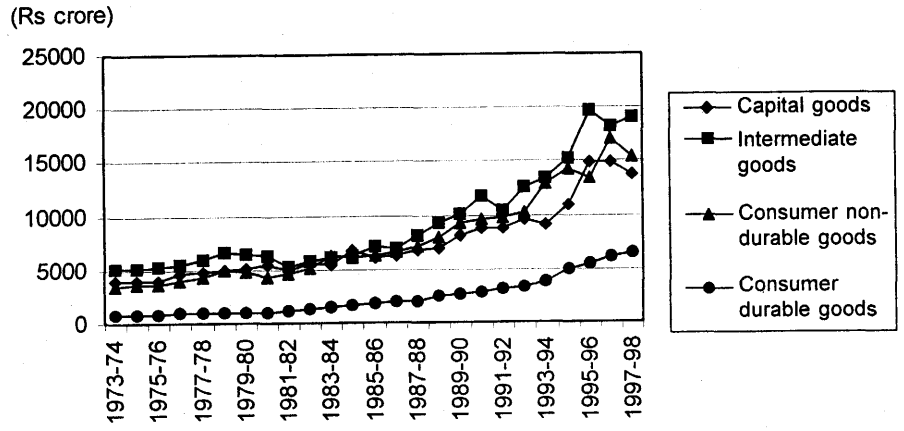

FIGURE 2. GVA IN 1981-2 PRICES

by increase of GVA of capital goods industries. Thus only a boom of consumer durable goods cannot explain the development of capital goods industries.

One can estimate four reasons for the investment boom. First, if market shows sign of good prospects, capacity will be expanded by the expectation. Second, financial liberalization made it easy for private corporate to procure fund. Third, if internal financing increases, it might encourage investment. Fourth, if relative price of capital goods vis-a-vis product price decreases, firms might increase investment.

GVA is a good indicator of market conditions. As rapid growth of GVA in an industry generates expectation that the industry will grow in the future, investment in the industry might increase. Abolition of industrial licensing might have encouraged investment on the basis of entrepreneurship. But entrepreneurs have their own estimation of market prospects and it does not always depend on the present trends of production, though some of them might have failed due to a wrong judgement. However, we can safely say that the main stream of investment will result in the rise of industries, not its decline.

Growth rates of GVA accelerated after 1991-2 (Figure 2). Capital goods, intermediate goods, consumer durable goods and total industries pass the dummy test with significant at 1 per cent.[3] Investment increased to fill up the expanding demand. In fact, growth rates of GFCF accelerated in capital goods, intermediate goods, consumer durable goods and total industries after 1991-2. We analyse which industries are growing in each industry group. When we consider backward effects, condition of consumer goods is important.

Consumer durable goods industries have developed constantly after economic reforms. Total GVA of consumer durable goods industry group at 1981-2 prices rose by 12.3 per cent per annum between 1991-2 and 1997-8. GVA of tyre and tube (NIC 310), electrical appliance (NIC 366), automobile

TABLE 1. GROWTH RATES OF GVA AND GFCF IN CONSUMER DURABLE GOODS INDUSTRIES

(%)

	1992-3	*1993-4*	*1994-5*	*1995-6*	*1996-7*	*1997-8*
GROSS VALUE ADDED						
310	28.4	0.0	12.8	-13.1	31.4	14.2
366	16.5	-7.3	200.7	-44.8	2.2	63.3
374	-6.9	45.1	11.4	47.0	27.5	-6.9
375	-9.3	22.6	48.8	38.9	2.8	-15.2
Subtotal	6.6	16.1	47.2	3.7	18.1	5.7
Total	3.1	13.9	33.0	6.8	13.2	6.6
GROSS FIXED CAPITAL FORMATION						
310	-30.7	-10.9	-100.3	NANI	35.5	-60.0
366	70.2	19.3	200.5	-58.6	13.1	19.2
374	47.8	10.2	-2.2	138.3	74.5	-63.0
375	5.8	63.0	-17.2	83.1	30.1	-20.2
Subtotal	1.1	9.5	-7.8	99.2	51.4	-51.3
Total	6.4	24.4	0.2	73.0	33.2	-44.5

NOTE: NIC 310 is tyre and tube industry. NIC 366 is electrical appliance industry. NIC 374 is automobile industry. NIC 375 is motorcycle industry.

SOURCE: Govt. of India, *Annual Survey of Industries* (various issues).

(NIC 374) and motorcycles (NIC 375) industries increased rapidly (Table 1). Their relative contribution to growth of total GVA of the industry group between 1991-2 and 1997-8 were 13.7 per cent, 18.9 per cent, 30.7 and 11.0 per cent respectively. In other words, these four industries were leading consumer durable goods industries. As these industries cater mainly to the domestic market, exports are not important. GFCF rose to meet increasing domestic demand. Tyre and tube and automobile industries were the main contributors of GFCF between 1991-2 and 1997-8. These two industries together accounted for from 42.9 per cent to 62.9 per cent of the total GFCF of the industrial group during the same period. GFCF of automobile industry jumped up in 1995-6 and 1996-7 and pushed up the total GFCF of the industrial group. Many foreign automobile companies started production since 1994. Daewoo came in 1994, Honda in 1995, Hyundai in1996, Toyota in 1997 and Ford in 1999. The development of automobile industry led the consumer durable goods industries in the 1990s. In electrical appliance industry, lumpy investment was implemented in 1994-5.

Consumer non-durable goods industries have also shown growth after the economic reforms. Total GVA of consumer non-durable goods industry group at 1981-2 prices rose by 13.2 per cent per annum between 1991-2 and 1996-7. GVA of food products (NIC 20-1), man-made textile (NIC 247), and drug (NIC 304) rose fast (Table 2). Their relative contribution to growth of total GVA of the industrial group between 1991-2 and 1996-7 were 22.2 per cent,

TABLE 2. GROWTH RATES OF GVA AND GFCF IN CONSUMER NON-DURABLE GOODS INDUSTRIES

(%)

	1992-3	*1993-4*	*1994-5*	*1995-6*	*1996-7*	*1997-8*
GROSS VALUE ADDED						
20-1	1.2	23.2	19.2	2.2	15.1	-5.5
247	42.8	14.0	3.2	15.9	65.2	-43.5
304	15.3	23.9	-4.3	-1.5	42.7	8.2
Subtotal	16.5	20.1	8.2	5.8	38.1	-18.6
Total	5.7	28.7	9.5	-6.0	32.6	-6.9
GROSS FIXED CAPITAL FORMATION						
20-1	18.6	-15.4	74.2	12.1	-24.7	-11.5
247	-14.0	64.1	48.9	13.3	-34.2	16.7
304	31.8	14.7	19.2	27.1	9.1	-19.0
Subtotal	12.5	6.7	54.1	15.1	-20.9	-6.7
Total	19.9	16.6	40.1	17.9	-9.9	-8.1

NOTE: NIC 20-1 is food product industry. NIC 247 is man-made textile industry. NIC 304 is drug industry.

SOURCE: As in Table 1.

39.8 and 13.5 per cent respectively. Their investment also show a continued increase up to 1995-6. These three industries together accounted for from 41.3 per cent to 51 per cent of the total GFCF of the industrial group between 1991-2 and 1997-8. Development of food products after economic reforms is also noteworthy. Electrical appliance, automobile, motorcycle and man-made textile industries cater mainly to the high-income groups. But food products are wage goods. Among food product industries, sugar (NIC 206) and vegetable oil (NIC 211) industries have grown steadily uptill 1996-7. Their GVA at 1981-2 prices rose by 11.2 per cent per annum and 24.5 per cent respectively between 1991-2 and 1996-7. The growth of food product industry suggests economic reforms had led to a trickle down effect. Change of consumer preference is reflected in the growth of man-made fibre industry. Consumer preference shifted from cotton to man-made fibre after 1976.[4] Exports of drugs have also increased rapidly during 1990s. Although the share of exports in output increased from 29.0 per cent in 1991-2 to 33.9 per cent in 1997-8.[5] The share of the domestic market is still much higher.

Because of backward linkage, total GVA of intermediate industry group at 1981-2 prices rose by 18.6 per cent between 1991-2 and 1995-6. GVA of fertilizer (NIC 301), plastic material and synthetic rubber (NIC 302), man-made fibre (NIC 306), refined petroleum products (NIC 314), and iron and steel (NIC 330) industries increased rapidly (Table 3). Their relative contribution to growth of total GVA of the industry group between 1991-2 and 1995-6 were 12.5 per cent, 14.6 per cent, 14.2 per cent, 13.3 per cent and 13.2 per cent respectively. Plastic material and synthetic rubber, man-made fibre, refined

TABLE 3. GROWTH RATES OF GVA AND GFCF IN INTERMEDIATE GOODS INDUSTRIES

(%)

	1992-3	*1993-4*	*1994-5*	*1995-6*	*1996-7*	*1997-8*
GROSS VALUE ADDED						
301	15.2	-13.0	31.7	31.2	-14.5	-35.6
302	137.9	28.3	13.6	139.8	-28.3	3.2
306	NA	12.7	-5.6	49.6	-19.0	1.9
314	58.4	6.3	15.4	28.6	-0.3	-68.6
330	42.8	14.0	3.2	15.9	-4.0	67.6
Subtotal	61.5	5.3	12.4	37.8	-11.7	-6.2
Total	25.5	6.2	12.9	31.5	-8.3	1.5
GROSS FIXED CAPITAL FORMATION						
301	-25.9	142.4	11.2	-25.5	18.4	25.2
302	247.3	12.5	-44.5	1487.3	-62.5	109.8
306	69.8	-47.3	104.5	105.7	-66.7	98.5
314	12.1	13.5	-19.7	-4.4	103.4	-40.5
330	-22.0	31.5	64.8	-36.7	-35.9	-1.8
Subtotal	-10.1	34.4	38.0	10.5	-33.0	21.7
Total	15.9	21.3	35.3	12.2	-8.0	-6.1

NOTE: NIC 301 is fertilizer industry.
NIC 302 is plastic material and synthetic rubber industry.
NIC 306 is man-made fibre industry.
NIC 314 is refined petroleum product industry.
NIC 330 is iron and steel industry.

SOURCE: As in Table 1.

petroleum product and iron and steel industries had lumpy investment in 1995-6, 1995-6, 1996-7 and 1994-5 respectively. Although GFCF of each industry has fluctuated, subtotal of five industries have grown constantly from 1991-2 to 1995-6. These five industries accounted for from 37.9 per cent to 60.3 per cent of total GFCF of the industry group between 1991-2 and 1997-8. The development of automobile industry expanded the demand for intermediate goods. Synthetic rubber industry supplies material to tyre and tube industries, which are classified under consumer durable goods industry. GVA of tyre and tube industries at 1981-2 prices rose by 11.2 per cent per annum between 1991-2 and 1997-8. Moreover, automobile industry also created the demand for iron and steel. Output at 1981-2 prices of automobile industry, which consists of NIC 373 and 374, amounted to Rs 5,739 crore between 1991-2 and 1995-6. As Leontief multiplier of motor vehicle on iron, steel and ferro alloys, iron and steel casting and forging, and iron and steel foundries was 0.087461, 0.035672, and 0.039187 in 1989-90,[6] motor vehicle generated demand of Rs 3,092 crore, Rs 1,261 crore, and Rs 1,385 crore for them respectively during the same period. The total amount accounted for 9.7 per cent of output of iron and steel industry during the same period.

TABLE 4. GROWTH RATES OF GVA AND GFCF IN CAPITAL GOODS INDUSTRIES

(%)

	1992-3	*1993-4*	*1994-5*	*1995-6*	*1996-7*	*1997-8*
GROSS VALUE ADDED						
353	-2.2	4.8	16.6	58.7	-30.7	-23.5
356	4.7	9.6	6.4	44.5	-9.1	-0.9
360	4.6	-10.6	25.1	7.7	-5.8	20.8
373	11.1	-14.5	47.1	94.3	-18.8	-16.5
Subtotal	5.4	-6.3	25.8	46.9	-15.1	-2.5
Total	10.3	-4.5	19.7	36.7	-2.3	-5.9
GROSS FIXED CAPITAL FORMATION						
353	62.6	-8.4	-13.1	48.6	-52.8	140.2
356	112.1	-75.5	-9.7	148.4	-23.4	-15.0
360	14.0	54.2	79.1	-21.0	-17.8	-43.0
373	35.7	49.0	-50.7	211.4	-15.2	-43.6
Subtotal	59.4	-11.3	-7.8	69.0	-21.2	-27.2
Total	48.7	-4.3	17.8	42.0	-4.9	-33.2

NOTE: NIC 353 is industry machinery for food and textile industry.
NIC 356 is non-electrical machinery industry.
NIC 360 is electrical industrial machinery industry.
NIC 373 is heavy motor vehicle industry.

SOURCE: As in Table 1.

Investment boom had created demand for capital goods industry in the early 1990s. Total GVA of capital goods industry group at 1981-2 prices rose by 14.6 per cent between 1991-2 and 1995-6. GVA of industrial machinery for food and textile industry (NIC 353), non-electrical machinery (NIC 356), electrical industrial machinery (NIC 360), and heavy motor vehicle (NIC 373) industries came up fast (Table 4). Their relative contribution to growth of total GVA of the industry group between 1991-2 and 1995-6 were 8.1 per cent, 8.9 per cent, 7.2 per cent, and 30.6 per cent respectively. Non-electrical machinery, electrical industrial machinery, and heavy motor vehicle industries had lumpy investment in 1992-3, 1994-5 and 1995-6 respectively. As mentioned before, growth of food product and man-made textile industries induced investment in capital goods industries. As a result, GVA of industrial machinery for food and textile industry rose substantially in 1995-6. GVA of heavy motor vehicles also jumped up in 1995-6. It can be estimated from the phenomena that transport of volume increased in the early 1990s. Production of medium and heavy commercial vehicles pushed up GVA of capital goods industry.

The coming of age of the stock market also might have encouraged investment in the 1990s. Since 1991, reforms were started in the credit and capital markets. In 1992 the Securities and Exchange Board of India (SEBI) Act replaced the Capital Issues Act. Prior to 1992, the government very closely regulated the primary issues market in almost every aspect. Now companies

TABLE 5. AVERAGE SHARE OF PROFIT AND DEPRECIATION IN GROSS INCOME

(%)

	1981-2 to 1990-1	*1991-2 to 1997-8*
Capital goods	0.373	0.403
Intermediate goods	0.529	0.605
Consumer durable goods	0.409	0.525
Consumer non-durable goods	0.383	0.515

SOURCE: As in Table 1.

were free to approach the capital market after they got a clearance from SEBI. Total amount of new capital issues by non-government public limited companies including preference shares and debentures at 1981-2 prices jumped up from Rs 2,927 crore in 1991-2 to Rs 8,525 crore in 1992-3.[7] It reached Rs 9,875 crore in 1994-5.[8] Number of issues as well as stock prices increased between 1991-2 and 1994-5. Annual average price earning ratio rose from 26.05 in 1991-2 to 41.24 in 1994-5.[9] The stock market boom was promoted by not only relaxation of the regulation but also with the inflow of foreign portfolio investment (FPI). Quarterly net inflow of FPI had been more than US $900 million between the third quarters of 1993-4 and 1994-5.[10] During the period, monthly average of price earning ratio had been above 32. However, the boom was over in 1994-5.

The stock boom was created by a small number of companies with strong performances. GFCF also has the same character. If a big company has lumpy investment, it might push up GFCF of the industry. The private sector got alternative source of funds in addition to loan from financial institutions. In fact, the survey on financial performance of non-government non-financial public limited companies by RBI shows that the share of paid-up capital in source of funds rose suddenly from 7.1 per cent in 1992-3 to 29.6 per cent in 1993-4 and 26.8 per cent in 1994-5.[11] The private corporate sector adjusted itself to the rise of interest rate after financial liberalization in 1991.[12]

In order to analyse internal financing, the share of profits in gross income is to be calculated. As the net income in ASI is obtained by deducting the rent paid and interest paid from the net value added, net income represents the factor share of employees and the entrepreneur in the net value added. Profits are excess of net income over the cost of employees' compensation, i.e. total emoluments and supplements to emoluments, i.e. (1) contribution to provident and other funds, and (2) workmen and staff welfare expenses. Depreciation is a source of investment. If the share of profit and depreciation in gross income, i.e. net income plus depreciation, increases, firms can allot higher percentage of income for investment. Table 5 shows average share in the 1980s and 1990s. In the four industry groups, the share rose in the 1990s. One can conclude that the share of employees' compensation cost declined in the four industry groups during the 1990s. Companies could now use internal financing to diversify

their production without expanding their capacity. But an increase in internal financing is also advantageous to investment.

In investigating the relative price of capital goods vis-à-vis products, capital goods index is divided by chain index of industry group (1981-2 = 100). When the ratio decreases, the relative prices of capital goods becomes cheaper. Investment is encouraged by the cheaper prices of capital goods. The ratio fell from 1.000 and 1.097 in 1991-2 to 0.932 and 0.989 in 1995-6 in intermediate and consumer non-durable goods industries. Decrease of the relative price of capital goods is advantageous to investment in intermediate and consumer non-durable goods industries. Although the relative prices in consumer durable goods industries rose, investment increased in the first of 1990s. It seems that the relative prices of capital goods do not affect investment.

The mid-1990s witnessed lumpy investment in the industries where GVA had grown. The aggregated picture of investment in each industry group showed rapid growth of GFCF in the first half of 1990s, which created demand for capital goods industry.

2. THE END OF INVESTMENT BOOM

The investment boom in India started in the first half of 1990 and was over by mid-1990s. GFCF declined in capital goods, intermediate goods, consumer non-durable goods and total industries after 1995-6 and in consumer durable goods industry after 1996-7. Decrease of GFCF was reflected in the decline of GVA in capital goods industry. As some industries had lumpy investment even after 1995-6, GVA of capital goods industry in 1996-7 and 1997-8 was still much higher than GVA in early 1990s. But one cannot expect rapid growth of GVA of capital goods industries. Four reasons could be attributed to the end of the investment boom. First, demand declined or stagnated. Second, as new capital issues by private corporate sector dropped, firms could not procure funds. Third, the rise of interest rates in 1995-6 refrained investment. Fourth, imports substituted domestic production. Further, an increase in imports too, may have affected domestic production. These four reasons will now be examined.

Although high growth rates of demand encouraged investment in the first half of 1990s, GVA started declining in the mid-1990s. If there was a decrease or stagnation in demand and fixed capital stock increased continuously, then underutilization of capacity would have occurred. This study estimates utilization ratio on the basis of minimum capital output ratio.[13] Fixed capital output ratios are calculated on the 1981-2 prices. A benchmark year is then selected on the basis of the observed lowest capital output rate in the 1990s. Since market conditions have changed after economic reforms, benchmark years are selected from the 1990s. The lowest observed capacity output ratio is considered as capacity output. The estimate of capacity is obtained by dividing

the real fixed capital stock by the minimum capital output ratio. The utilization rate is given by actual output as a proportion of the estimated capacity.

Thus,

$$U = \frac{O}{\underline{C}} \times 100$$

$$\underline{C} = \frac{C}{(C/O)\min}$$

where U is capacity utilization, O is GVA, $\underline{C}$ is estimate of capacity, C is gross fixed capital stock (GFCS).

GFCS was estimated by the perpetual inventory method. A GFCS in year T, denoted by K_T, is based on the following formula:

$$K_T = K_o + \sum_{t=1}^{T} (I_t - DS_t)$$

where KC_o is the benchmark year, fixed capital stock, I_t is the gross investment at constant price in fixed assets in year t, and DS_t is the amount of fixed assets at constant price discarded during year t. I_t is defined as

$$I_t = F_t / P_t$$

where F_t is gross fixed capital formation (GFCF) and P_t is the capital goods price. It is difficult, however, to obtain data of DS_t. In this study it is assumed that DS_t is zero. According to A. Banerji doubling of the book value of the benchmark year serves as a measure of replacement value of fixed assets for the year.[14] But Goldar maintains that the choice of benchmark year is arbitrary.[15] Nevertheless, the present study uses the Banerji model. Goldar, Hashim and Dadi estimated the replacement value of fixed assets in benchmark years after analysing the balance sheets of firms.[16] The benchmark years 1951 and 1960 respectively selected by them were outdated because the industrial structure has changed in the last four decades. The purpose of this study is to estimate the underutilization of capacity. The year 1979-80 is selected as the benchmark year because GFCF data is available only after 1979-80. The trends of GFCS are more important than its absolute level for this purpose.[17] If the perpetual inventory method takes longer period, the weight of margins of errors in benchmark year becomes less.

Although, utilization rates of the four industrial groups peaked in the mid-1990s, they witnessed a clear drop after the mid-1990s. Therefore, it can be concluded that underutilization of capacity made its appearance across the four industrial groups. To confirm this conclusion, capital productivity (GVA per GFCS) and labour productivity (GVA per worker) during pre-peak year and post-peak year are calculated. Compound growth rates of capital and labour productivity dropped during the period of the post-peak year (Table 6). Particularly in the capital and intermediate goods industries, labour productivity became negative during the post-peak period. The trends of labour productivity

TABLE 6. GROWTH RATES OF CAPITAL AND LABOUR PRODUCTIVTY DURING THE 1990s

(%)

	Pre-peak year		*Peak year*	*Post-peak year*	
	Capital	*Labour*		*Capital*	*Labour*
Capital goods	5.5	9.5	1995-6	-10.9	-3.4
Intermediate goods	7.1	11.5	1995-6	-9.5	-0.1
Consumer durable goods	4.3	11.7	1993-4	-6.9	1.4
Consumer non-durable goods	3.7	8.7	1994-5	-0.5	8.1
Total	3.2	8.7	1995-6	-7.5	1.1

SOURCE: As in Table 1.

can be explained by the utilization rate of capacity. In other words, capital and labour productivity went down due to underutilization of capacity. Although GVA started to decline after 1996-7 in consumer non-durable goods industry group and GVA had risen constantly in consumer durable goods industry group, utilization rates dropped after 1993-4 and 1994-5 respectively. GFCF of consumer non-durable and durable goods industries declined with two years lag after utilization rates started to decrease. Decline of utilization reduced their GFCF at 1981-2 prices with two years lag. It is noteworthy that under-utilization made its appearance in consumer durable and non-durable goods industries earlier than in capital and intermediate goods industries. When producers of consumer non-durable and durable goods show decreased rate of growth of production, it naturally affects capital and intermediate goods industries. Annual growth rates of material consumed in consumer non-durable and durable goods industries dropped from 8.0-20.4 per cent between 1991-2 and 1995-6 to 1.3 and 2.5 per cent between 1995-6 and 1997-8 respectively. This restricted the demand of the intermediate goods industry. The utilization rates of the intermediate goods industries group dropped after 1995-6 and its GFCF also declined after 1995-6 without any time lag; the reason being lumpy investment by efficient and big companies. Expansion of capacity by big companies increased output sharply. However, if demand grew by lower rate than output, over-capacity might have occurred immediately.

Sudden drop of new capital issues might have made it difficult to procure funds from stock market. The total amount of new capital issues by non-government public limited companies including preference shares and debentures at 1981-2 prices went down sharply from Rs 9,875 crore in 1994-5 to Rs 1,028 crore in 1997-8. On the other hand, amounts disbursed by all financial institutions at 1981-2 prices jumped from Rs 12,549 crore in 1994-5 to Rs 17,578 crore in 1997-8.[18] In other words, industries could procure funds from financial institution. The reasons behind the decrease of new capital issue could be ascribed to two reasons. First, the lending rates of financial institutions fell. In India, financial institutions supply long-term funds for investments.

The prime lending rates of IDBI (Industrial Development Bank of India) went down from 16-19 per cent in 1995-6 to 13.3 per cent in 1997-8. Second, there was a decline in stock prices. The annual average of price earning ratio dropped from 41.24 in 1994-5 to 19.92 in 1995-6. Therefore, attractiveness to stock issue was adversely affected by this decline of the price earning ratio. A survey of the non-governmental, non-financial public limited companies shows a decrease in the share of paid-up capital as sources of funds, from 26.8 per cent in 1994-5 to 8.3 per cent in 1997-8. On the other hand, the share of loans from financial institutions rose from 3.9 per cent to 9.9 per cent during the same period. There is a substitutive function between the stock market and financial intermediaries in terms of financing private investment.[19] Although fluctuation of lending rates causes shift of financial source, this is not reflected in trends of GFCF clearly.

When the RBI tightened its monetary policy in 1995-6, interest rates of financial institutions rose. Interest rates are correlated with the disbursements of financial institutions. Disbursement by all the financial institutions which was deflated at 1981-2 prices came up by 5.4 per cent in 1995-6 when the prime lending rate of the IDBI was raised from 15 per cent to 16-19 per cent. On the other hand, disbursements increased by 22.8 per cent in 1997-8 when lending rates were reduced from 16.2 per cent to 13.3 per cent. A sample survey by the IDBI shows that the total long-term borrowing of 520 companies at 1981-2 prices went down by 14.1 per cent but total GFCF at 1981-2 prices came up by 14.5 per cent in 1995-6.[20] Another sample survey by IDBI shows that the total long-term borrowing of 550 companies rose by 13.6 per cent but the total GFCF decreased by 3.1 per cent due to inventory increase by 28.6 per cent in 1997-8.[21] As investment strategy is a long-term derivative it is not affected immediately by change of interest rates.[22]

Total imports in terms of dollars increased by 13.5 per cent per annum between 1991-2 and 1997-8. This can be ascribed to three reasons. First, import licensing was relaxed after economic reforms. Second, import duty was reduced after economic reforms. Third, domestic demand expanded in the first half of 1990s. On the other hand, rupee rates vis-à-vis one US dollar were depreciated from 31.5 in August 1995 to 39.5 in March 1998 which might have restricted imports. Reduction of import duty is offset by depreciation of rupee.

Trends of imports depend on domestic demand. Imports of capital goods deflated by 1981-2 prices rose till the mid-1990s but declined since 1995-6 (Table 7). Although imports of machinery (barring electric and electronic) rose rapidly till 1995-6, they went down after 1995-6. Imports of machinery accounted for an increase from 32.8 per cent to 43.6 per cent of the total capital goods imports in the 1990s. On the other hand, imports of electronic goods rose rapidly. Investment boom induced the import of machinery till 1995-6. After the investment boom was over, imports of capital goods stagnated. Sudden depreciation of the rupee after September 1995 was advantageous to

TABLE 7. GROWTH RATES OF CAPITAL GOODS IMPORTS

(%)

	1992-3	*1993-4*	*1994-5*	*1995-6*	*1996-7*	*1997-8*	*1998-9*
Manufacture of metals	18.7	28.4	4.8	33.5	15.7	6.1	30.0
Machine tools	2.0	-2.3	-30.8	211.9	43.6	-17.1	-8.6
Machinery except electrical and electronic	20.3	19.5	31.4	42.4	-5.5	2.5	-6.5
Electrical machinery except electronic	39.3 *	-74.1*	11.6	52.1	-14.3	19.9	23.8
Electronic goods	N.A.	N.A.	22.0	41.3	-17.3	51.3	18.4
Computer goods	N.A.	N.A.	119.5	174.2	-28.9	107.7	6.3
Transport equipment	32.0	188.8	-20.6	-1.8	36.6	-26.9	-15.5
Project goods	-7.8	33.3	3.5	27.7	-9.9	-15.3	71.9
Total	25.8	49.2	20.9	45.9	1.9	3.4	16.3
	(6300.9)	(9400.4)	(11369.5)	(16588.7)	(16909.7)	(17478.2)	(20327.1)

NOTE: Figures in parenthesis indicate total import in 1981-2 prices, which are Rs in crores. It is deflated by wholesale index of machinery and machine tools.
* The figure include electronic goods and computer goods.
SOURCE: As in Table 1.

domestic manufacturers. But the production of capital goods grew till 1995-6 and stagnated after 1995-6. Capital goods industries consists of 13 industries. In all these industries except NIC 378 (bullock carts and pushcarts), production rose up to mid-1990s. The degree of dependence on imports is different amongst different industries. We can calculate the share of import in domestic consumption, i.e. total output plus import from the Input-Output Transactions Table. The share in industrial machinery for food and textiles, industrial machinery for others, machine tools, electric industrial machinery, and motor vehicles was 18.2 per cent, 7.7 per cent, 22.3 per cent, 6.6 per cent and 3.6 per cent respectively in 1989-90.[23] We have more detailed examination in the next paragraph.

3. CAPITAL GOODS INDUSTRIES IN THE 1990s

The effect of investment boom is reflected in the production and investment of capital goods industries. As mentioned before, NIC 353, 356, 360 and 373 are playing important roles in capital goods industry. We will examine them turn by turn. The machine tool industry is investigated in detail to analyse the impact of imports.

(1) Industrial Machinery for Food and Textile Industries (NIC 353)

Growth of investment in food and man-made fibre industries created demand for this industry. GVA at 1981-2 prices rose up to 1995-6 and declined after 1995-6. GFCF at 1981-2 prices came up in the 1990s to meet rising demand.

Over-capacity occurred in 1995-6. In spite of that, there was lumpy investment in 1997-8. Growth rates of capital and labour productivity declined by 11.9 per cent per annum and 8.6 per cent from 1991-2 to 1993-4, rose by 26.6 per cent and 33.8 per cent from 1993-4 to 1995-6 and dropped by 32.4 per cent and 19.3 per cent from 1995-6 to 1997-8 respectively. Material consumed at 1981-2 prices followed the same trends. It went down by 8.5 per cent, increased by 30.4 per cent and fell by 9.9 per cent during the same period. The figures for the number of workers also showed the same trends. It increased from 1991-2 to 1995-6 and fell after 1995-6 onwards.

Imports of industrial machinery for food and textiles followes the same trends along with the domestic output. Imports of industrial machinery for food (Indian Trade Classification 8433, 8434, 8435, 8437, and 8438) and industrial machinery for textiles (ITC 8444, 8445, 8446, 8447, and 8448) increased by 39.8 per cent per annum and 58.5 per cent respectively, between 1991-2 and 1995-6 but decreased by 13.1 per cent and 16.5 per cent respectively, between 1995-6 and 1998-9.[24] The share of imports in domestic consumption, i.e. output plus imports minus exports in industrial machinery for food and textiles industries rose from 23.9 per cent in 1992-3 to 36.8 per cent in 1994-5 but fell to 27.2 per cent in 1997-8.[25] Therefore, it seems that domestic production was not affected by imports.

(2) General Purpose Non-electrical Machinery (NIC 356)

This category includes lifting and handling equipment, pumps compressors, taps and valves and bearing, gears, etc. Although GVA at 1981-2 prices came up constantly by 15.2 per cent per annum between 1991-2 and 1995-6, it declined after 1995-6 onwards. On the other hand, there was lumpy investment in 1992-3 and 1995-6. Consequently, over-capacity occurred and utilization rates went down after 1995-6. Growth rates of capital and labour productivity increased by 4.1 per cent per annum and 9.9 per cent between 1991-2 and 1995-6 and decreased by 11.4 per cent and 6.0 per cent between 1995-6 and 1997-8 respectively. Material consumed at 1981-2 prices rose by 9.7 per cent and fell by 6.9 per cent during the same period. Number of workers increased by 4.9 per cent from 1991-2 to 1995-6 and by 1.0 per cent from 1995-6 to 1997-8.

(3) Electrical Industrial Machinery (NIC 360)

This industry shows different picture. GVA at 1981-2 prices rose by 7.9 per annum between 1981-2 and 1992-3. As demand increased, investment came up to meet it. GFCS at 1981-2 prices grew by 11.3 per cent during the same period. As GFCF accelerated after 1992-3, GFCS at 1981-2 prices increased by 16.6 per cent from 1992-3 to 1997-8. But annual growth rates of GVA at 1981-

2 prices fell to 6.5 per cent during the same period. As a result, utilization of capacity went down from 1992-3. Growth rates of capital and labour productivity decreased from 4.6 per cent and 5.8 per cent between 1981-2 and 1992-3 to -3.6 per cent and 4.4 per cent between 1992-3 and 1997-8 respectively. Growth rates of material consumed in 1981-2 prices went down from 7.5 per cent between 1981-2 and 1992-3 to 3.8 per cent between 1992-3 and 1997-8. Number of workers increased constantly during the 1980s and 1990s.

(4) Automobile Industry (NIC 373 and 374)

ASI changed classification in 1989-90. NIC 374 in 1970 code was divided into NIC 373 (heavy motor vehicle) and NIC 374 (motor cars). Data on NIC 373 can be obtained after 1989-90 onwards. GVA at 1981-2 prices was stagnant between 1989-90 and 1993-4, grew rapidly between 1993-4 and 1995-6 and fell after 1995-6 onwards. Material consumed at 1981-2 prices also followed the same trends. The industry witnessed lumpy investment in 1995-6 and 1996-7. Company-wise data on production of buses and trucks are available. TELCO, Ashok Layland, and Hindustan Motors produce trucks. Production of TELCO rose by 39.0 per cent and 21.8 per cent in 1995-6 and 1996-7 respectively.[26] In other words, large-scale investment by TELCO expanded capacity and raised output. But production of trucks suddenly dropped in 1997-8.

To calculate GFCS, we need data for the 1980s. We analyse combined data of NIC 373 and 374, i.e. NIC 374 in 1970 code. The share of NIC 373 and 374 in net value added was 55.5 per cent and 45.5 per cent in 1989-90. Investment in automobile industry accelerated in the 1990s. GFCS jumped up by 29.7 per cent in 1995-6 and by 32 per cent in 1996-7. Although GVA at 1981-2 prices rose up to 1995-6, it has stagnated since 1995-6 onwards. As a result, utilization rate went down after 1995-6. Capital and labour productivity increased by 14.6 per cent and 18.2 per cent between 1991-2 and 1995-6 and decreased by 17.3 per cent and 6.5 per cent between 1995-6 and 1997-8 respectively.

(5) Machine Tools (NIC 357)

Machine tools are power driven machines used for cutting, forming, shaping or processing metals or other materials into desired forms. Since these materials are used for the manufacture of machine tools as well as other machines, the development of the machine tools industry indicates the technological level of the country and the condition of the machine industry as a whole. Although the machine tools industry accounted for only 2.3 per cent of total GVA of capital goods industry group in 1997-8, this sector is crucial for technological development. If many units had introduced new technology, the demand for machine tools might have shifted from ordinary machine tools to sophisticated ones.

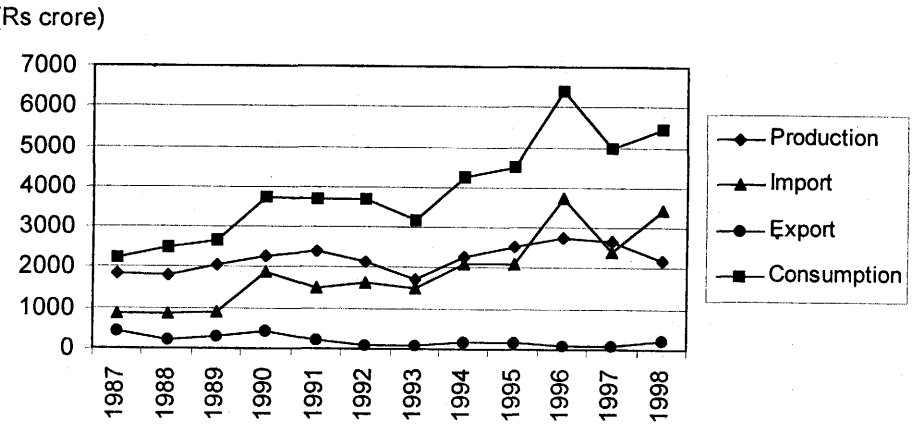

FIGURE 3. PRODUCTION OF MACHINE TOOLS AT 1981-2 PRICES

Therefore, impact of economic reforms is reflected in production and import composition.

NC (numerical control) machine tools diffused in the second half of 1980s. The share of NC machine in total production of machine tools rose from 8.5 per cent in 1986 to 31.1 per cent in 1989. The share came up to 37.3 in 1993. As non-NC machine was substituted by NC machine, production of automatics and non-NC lathe machine declined.[27] However, the share has not changed after 1994. Although the production of automatics declined, that of non-NC lathe machine remained at the same level.

Figure 3 shows that the trends of consumption of machine tools depends on imports. Domestic production kept up at the same level as the pre-reform period. Imports of machine tools rose after the economic reforms. Consequently, the share of domestic production in domestic consumption fell from 65.3 per cent in 1991 to 40.4 per cent in 1998. Domestic demand expanded because automobile and automobile component industries developed. Construction of new automobile plants increased imports of machine tools. Hyundai and TELCO plants were set up in 1996 and 1998, respectively. When new automobile plants were set up, imports exceeded production. In 1998-9 imports by TELCO accounted for 19.7 per cent of total imports of machine tools.[28] Domestic manufacturers do not have capacity to cater for demand from lumpy investment. Although the share of domestic production in consumption went down, it was not substituted by imports on a large-scale.

CONCLUSION

Abolition of industrial licensing encouraged investment on the basis of entrepreneurship. A few industries among each industry group shows rapid growth of GVA. Tyre and tube, electrical appliances, automobile, and motorcycles

industries grew in consumer durable goods industry group. Automobile industry had lumpy investment in 1995-6 and 1996-7. Food products, man-made textiles, and drug industries rose in the consumer non-durable goods industry group. Growth of these industries increased demand of intermediate goods through backward linkage. As a result, plastic material and synthetic rubber, man-made fibre, refined petroleum products, and iron and steel led to the intermediate goods industries. To meet the expansion in demand, lumpy investment was implemented in the four industries between 1994-5 and 1996-7. Large-scale investment created demand for capital goods. GVA of capital goods industry group accelerated after 1991-2.

Production capacity grew faster than demand. Consequently, overcapacity made appearance and utilization of capacity declined. GFCF decreased with time lag. Although GVA of capital goods industry group in 1996-7 and 1997-8 was still much higher than GVA in early 1990s, we cannot expect its rapid growth. Stock boom and increase of internal financing might have generated advantageous circumstances for investment. But these two reasons cannot explain why GFCF declined after 1995-6. Tightening policy of RBI in 1995-6 might have had an impact on the macro-economy. As investment is a long-term derivative, change of interest rate does not affect GFCF directly. Only decline of utilization can explain reduction of GFCF after 1995-6.

Imports of capital goods depend on domestic demand. Their imports increased between 1991-2 and 1995-6. During this period, GVA of all capital goods industries except bullock and pushcarts rose. After 1995-6 both imports and domestic production stagnated. In machine tool industry the share of production in domestic consumption fell to 65.3 per cent in 1991 and 40.4 per cent in 1998. When new automobile plants were set up, imports exceeded production. Domestic production was maintained at the same level in the 1990s and it has not been substituted on a large-scale.

NOTES

1. C.P. Chandrasekhar, 'Explaining Post-Reform Industrial Growth', *Economic and Political Weekly*, Special Number, 1996, p. 2543.
2. Govt. of India, *National Accounts Statistics: Factor Incomes 1980-1–1989-90*, 1994.
3. In investigating the issue of whether there was acceleration in the growth rate of GFCF after economic reforms, dummy variables are used to allow both the intercept and the slope to be different after 1991 onwards. Thus we estimate a typical regression equation:

$$\ln Y = \alpha + \alpha' D + \beta t + \beta' Dt$$

where α is a dummy variable with values equal to zero for the years up to 1990-1 and one thereafter. The coefficient of the multiplicative dummy term, β', if it is positive and significant, shows that there was acceleration in the gross rate in the post-economic reform period.

4. S. Uchikawa, *Indian Textile Industry: State Policy, Liberalization and Growth*, New Delhi: Manohar, 1998, p. 77.
5. Homepage of Ministry of Chemical and Fertilizers, http://www.nic.in/cpc/pharma.htm.
6. Govt. of India, *Input-output Transactions Table 1989-90*, 1997, p. 254.
7. The amount is deflated by chain index of capital goods.
8. RBI, *Handbook of Statistics on Indian Economy*, 2000, p. 95.
9. Ibid., p. 425.
10. Altough net inflow of FPI continued up to 1998, it could not sustain stock market. Ibid., pp. 302-3.
11. RBI, *RBI Bulletin* (various issues).
12. K. Sen and R.R. Vaidya, *The Process of Financial Liberalization in India*, New Delhi: Oxford University Press, 1997, p. 130.
13. D.U. Sastry, *The Cotton Mill Industry in India*, New Delhi: Oxford University Press, p. 28.
14. A. Banerji, *Capital Intensity and Productivity in Indian Industry*, New Delhi: Macmillan, 1975, p. 21.
15. B.N. Goldar, *Productivity Growth in Indian Industry*, New Delhi: Allied, 1985, p. 58.
16. S.R. Hashim and M.M. Dadi, *Capital-Output Relations in Indian Manufacturing: 1946-1964*, Baroda: MS University of Baroda, 1973, p. 13.
17. Goldar pointed out the difference in TFP estimates between studies may be attributed largely to the differences in capital estimates. B.N. Goldar, 1985, p. 50.
18. RBI, 2000, p. 87.
19. M. Nagaishi, 'Stock Market Development and Economic Growth: Dubious Relationship', *Economic and Political Weekly*, 17 July 1999, p. 2011.
20. IDBI, *Financial Performance of IDBI Assisted Companies in the Private Corporate Sector*, 1995-6, pp. 22-3.
21. IDBI, 1998-9, pp. 22-3.
22. We cannot find out relation between long-term borrowing and GFCF with one year time lag.
23. The share of export of industrial machinery for food and textile, industrial machinery for others, machine tools, and electric industrial machinery in total output was 13.4 per cent, 12.1 per cent, 5.2 per cent, and 1.6 per cent respectively in 1989-90. As weight of exports of capital goods in total output has been low, this chapter does not examine exports (Govt. of India, *Input-Output Transactions Table 1989-90*, 1997, p. 226).
24. Govt. of India, *Monthly Statistics of Foreign Trade of India* (various issues).
25. As output do not include unorganized sector, this share is overestimated.
26. Automotive Component Manufacturers Association of India, *Facts and Figure*, 1999-2000, p. 19.
27. S. Uchikawa, 'Economic Reforms and Foreign Trade Policies: Case Study of Apparel and Machine Tools Industry', *Economic and Political Weekly*, 27 November 1999, p. M147.
28. Indian Machine Tool Manufacturers' Association, Data on Import of Machine Tools 1998-9.